

FIG. 48

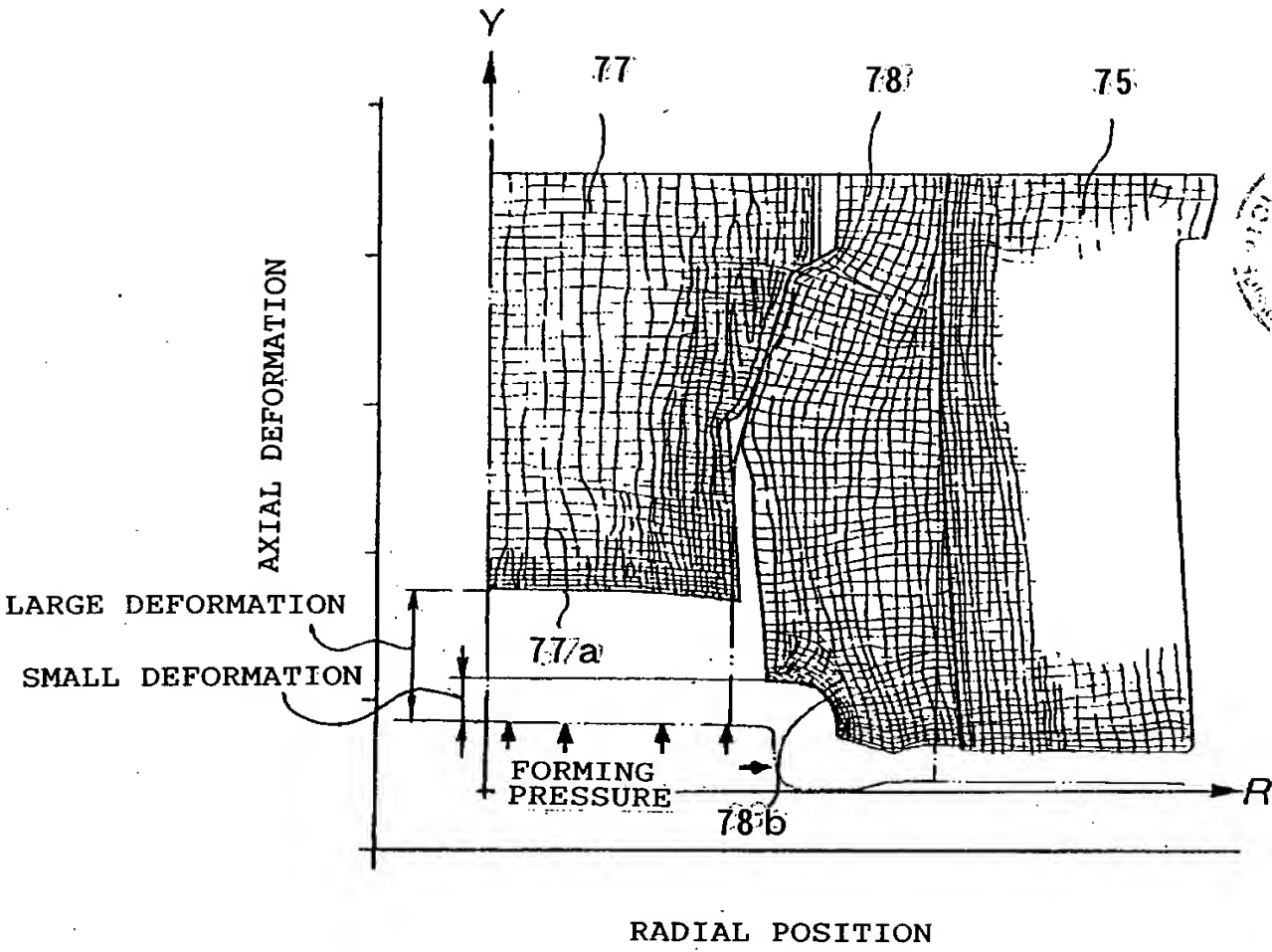


FIG. 46

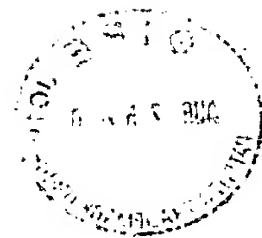
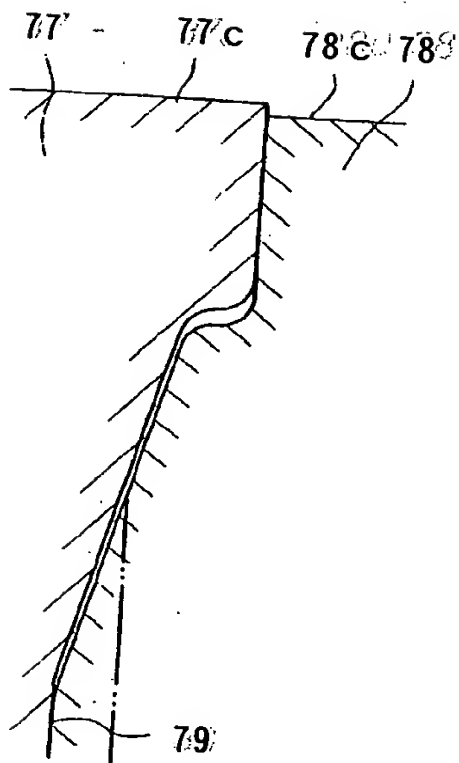


FIG. 47

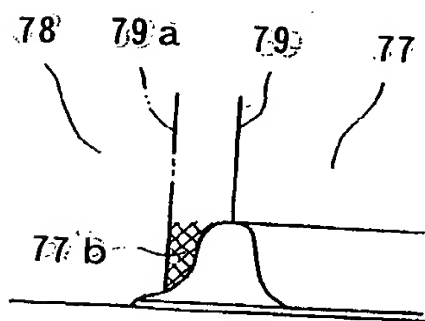


FIG. 44

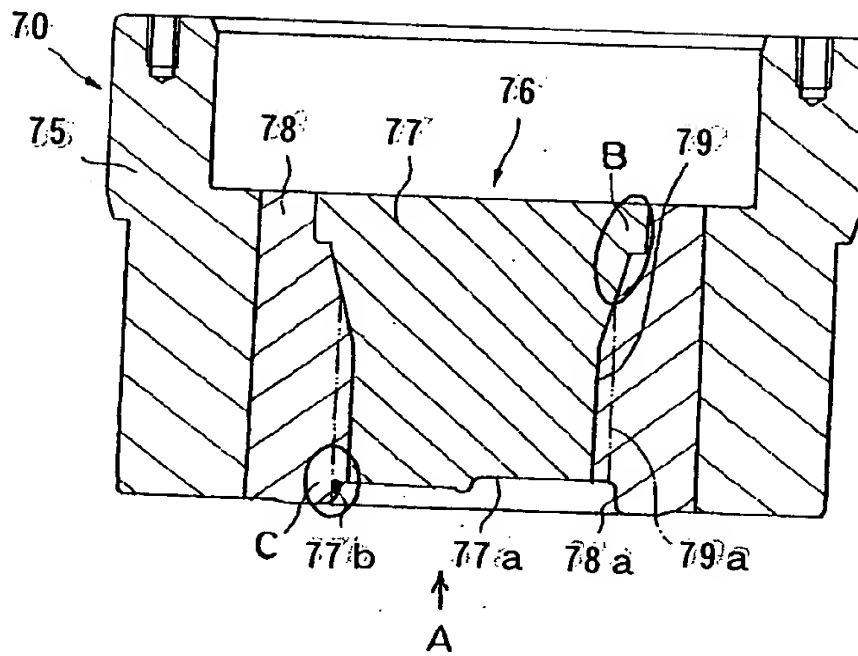


FIG. 45

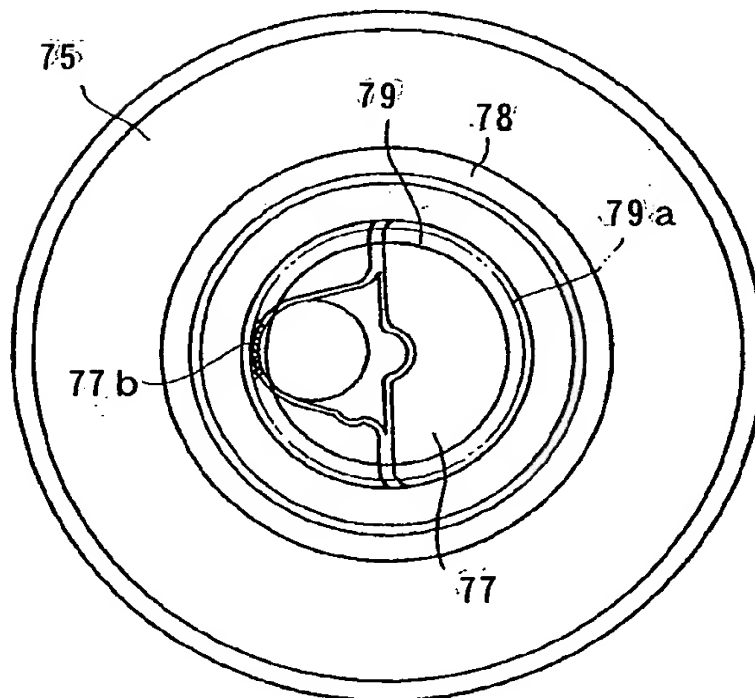


FIG. 43

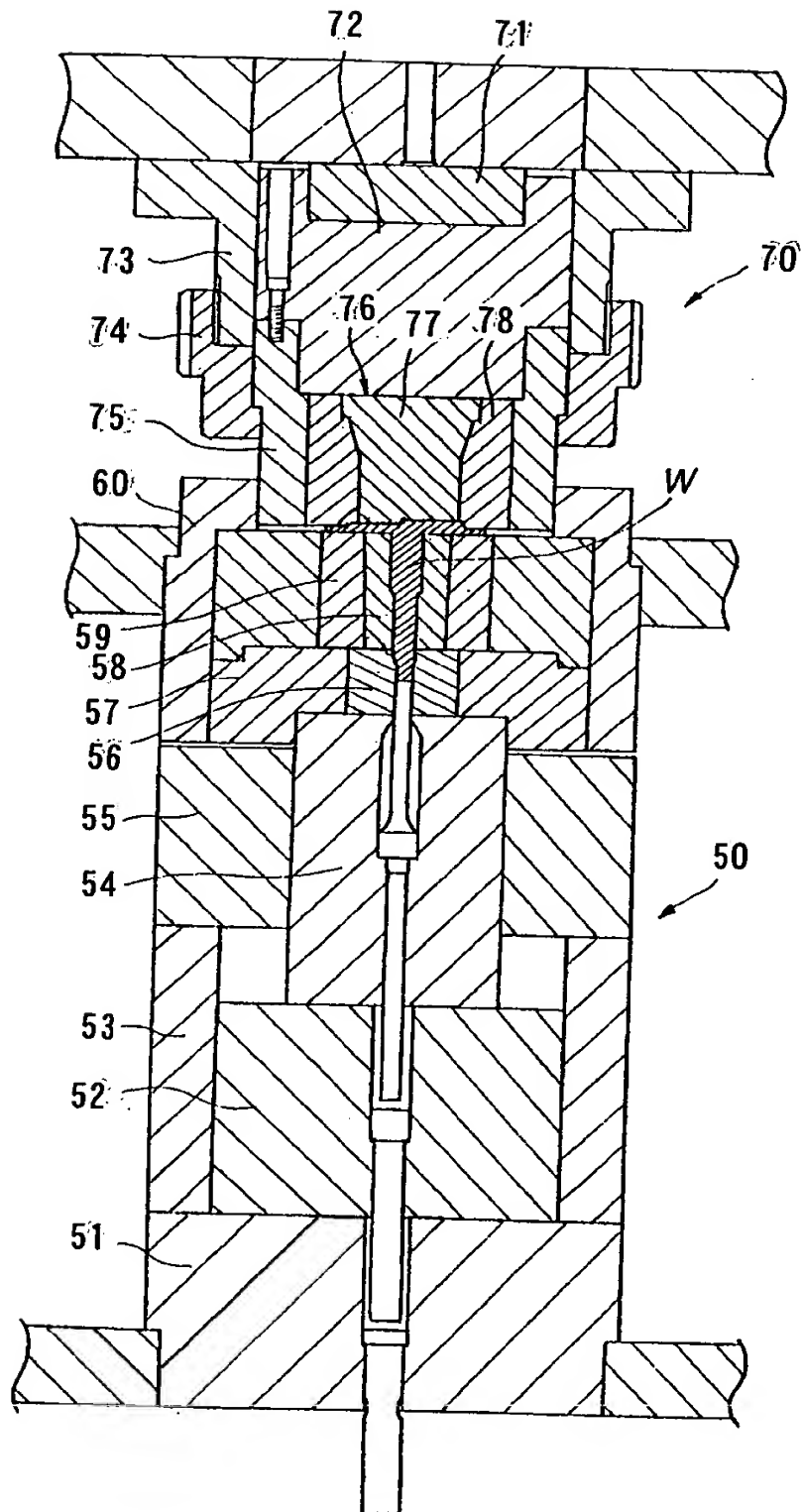
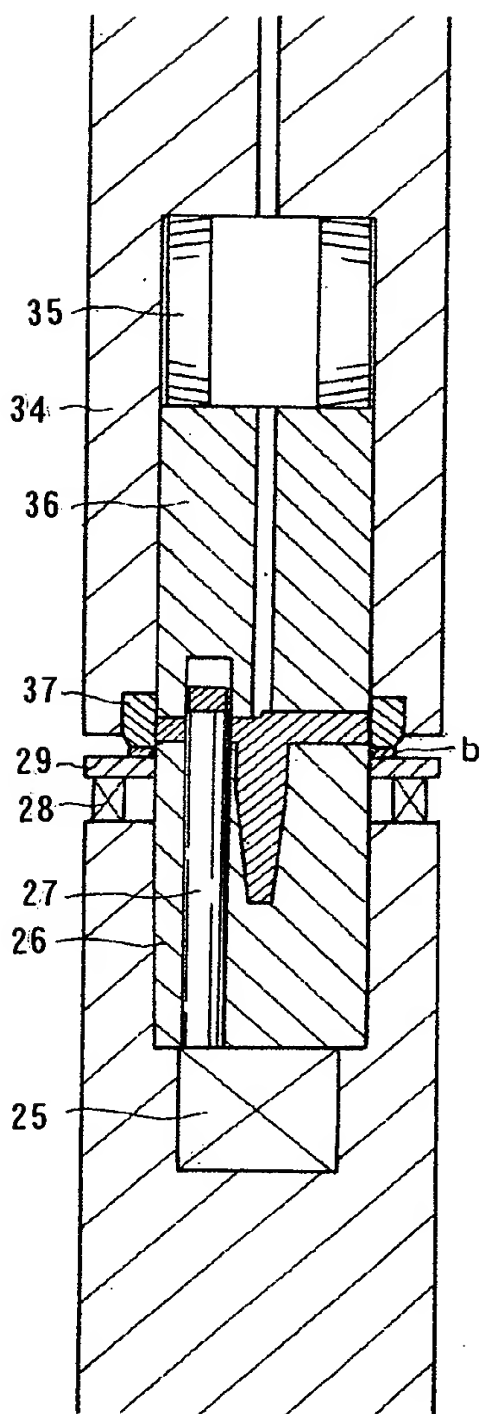
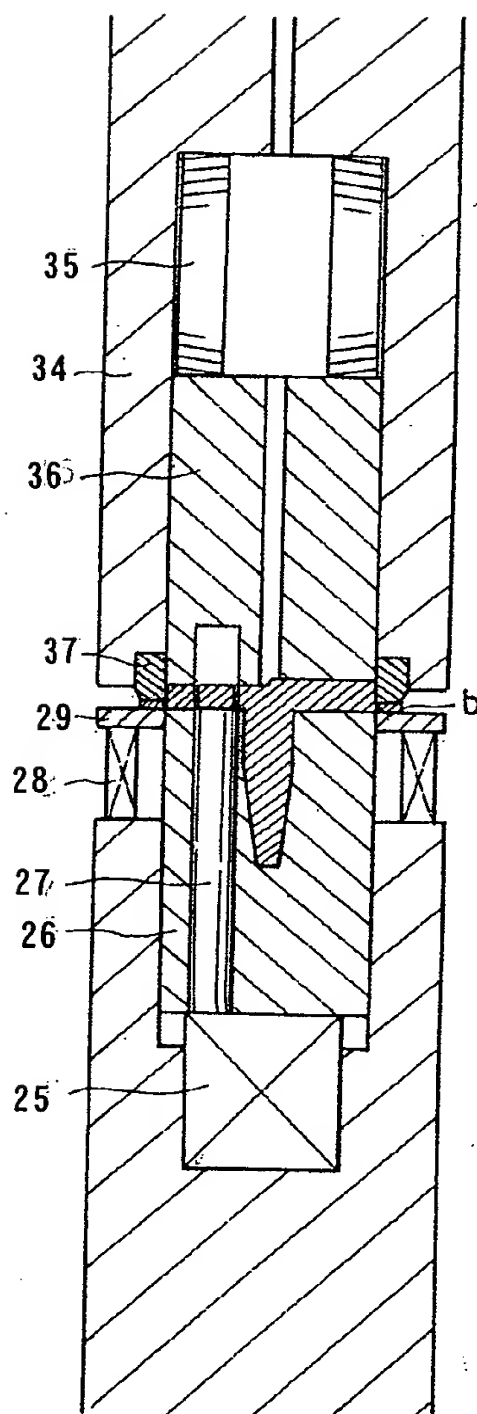


FIG. 42



(a)



(b)

FIG. 41

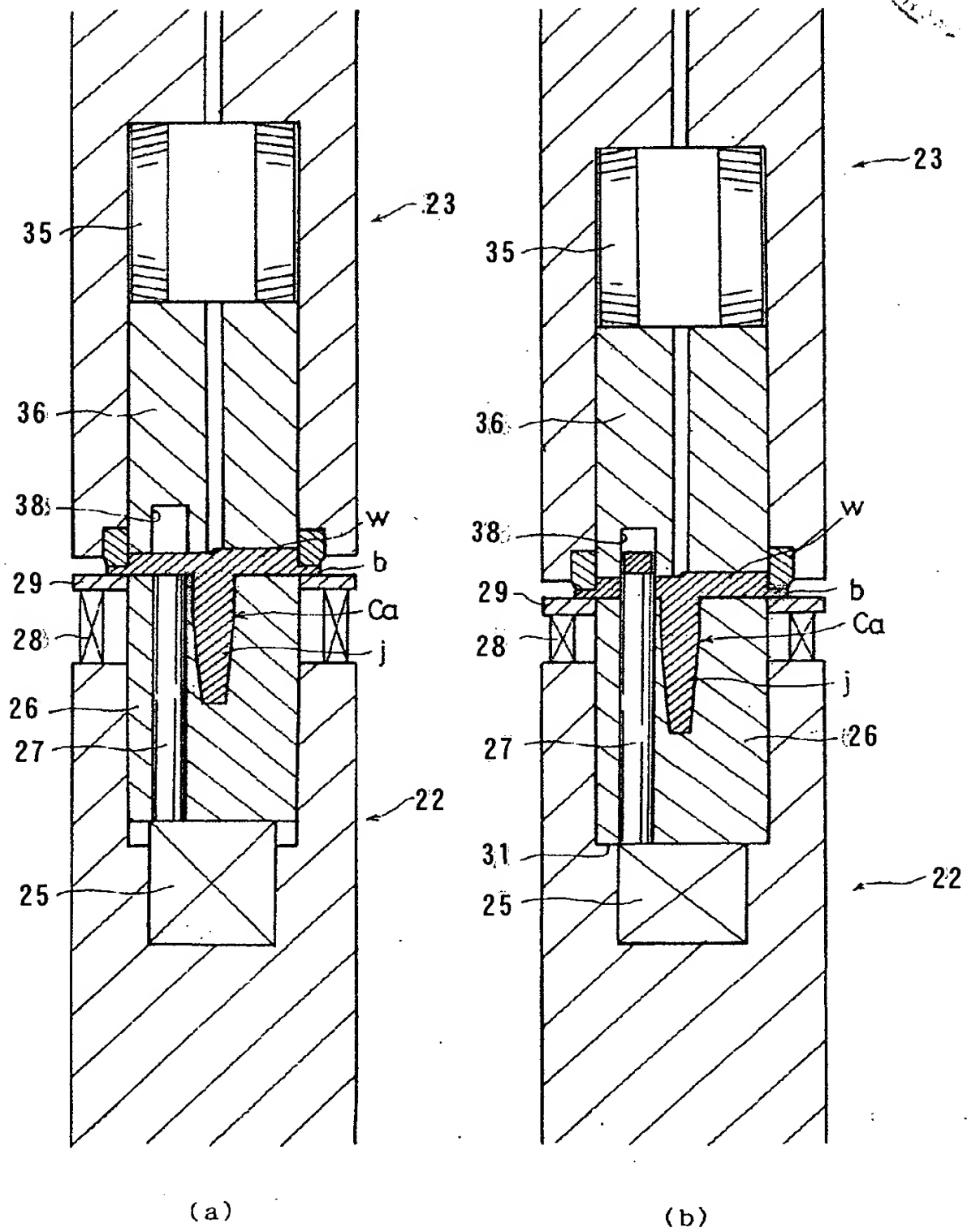




FIG. 39





FIG. 38

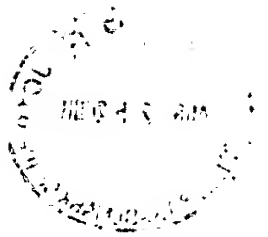
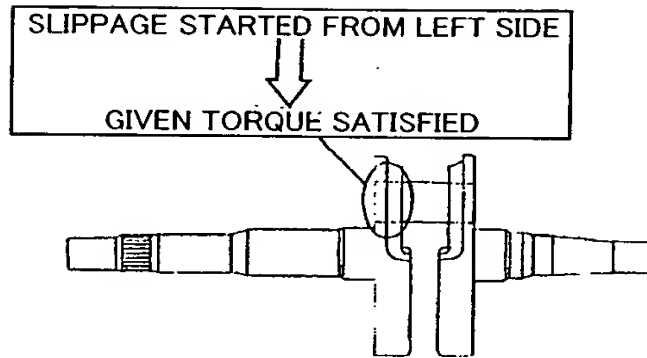


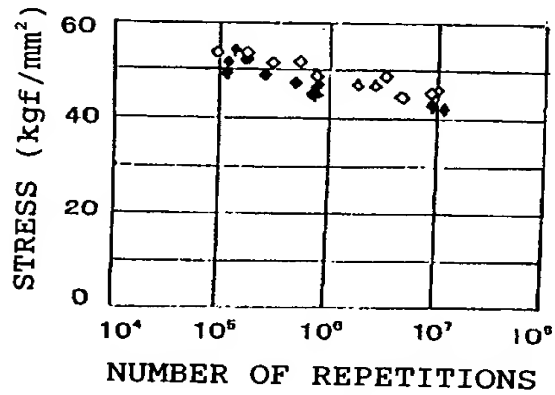
FIG. 37

SLIP TORQUE



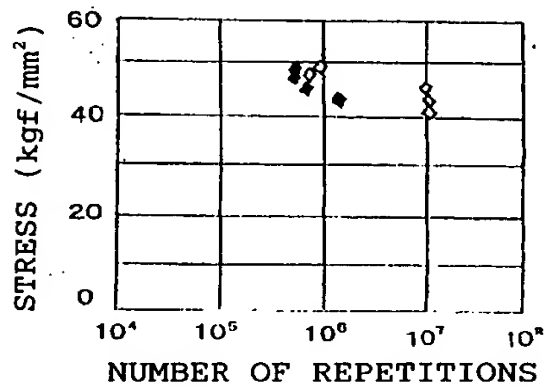
(a)

S - N CURVE (ROTATIONAL BENDING FATIGUE TEST)



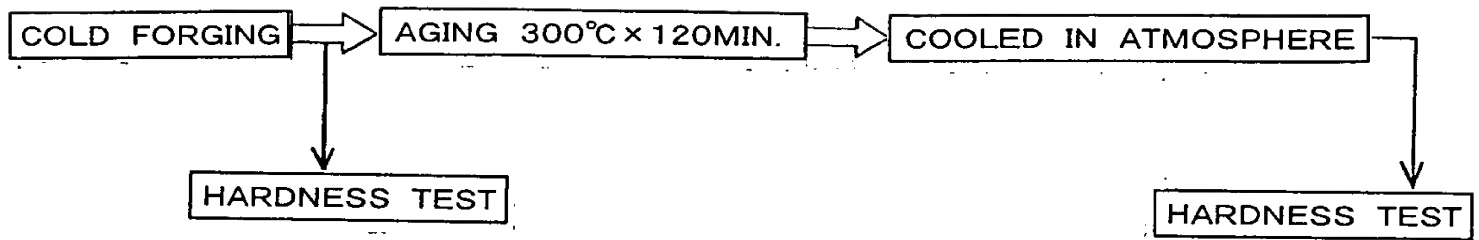
(b)

S - N CURVE (SOLID BENDING FATIGUE TEST)

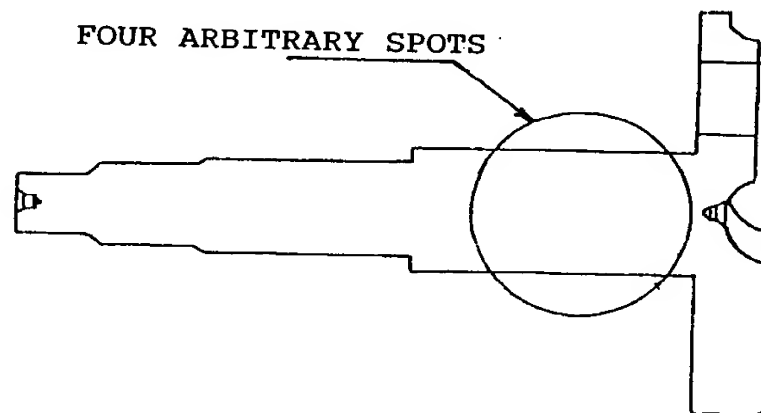


(c)

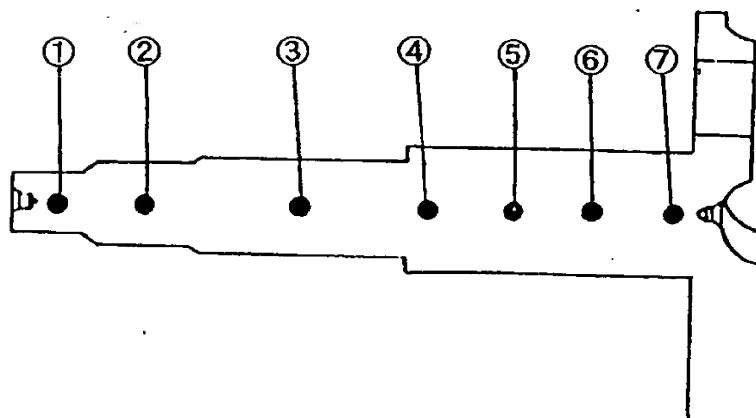
FIG. 36



(a)



(b)



(c)

FIG. 35

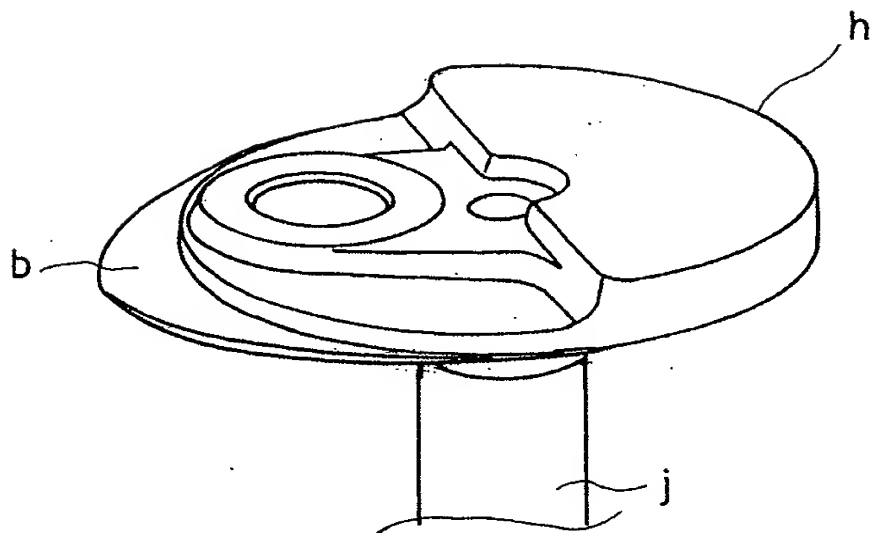
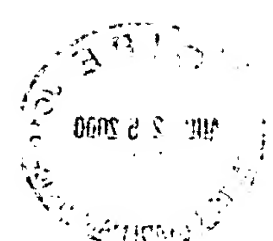
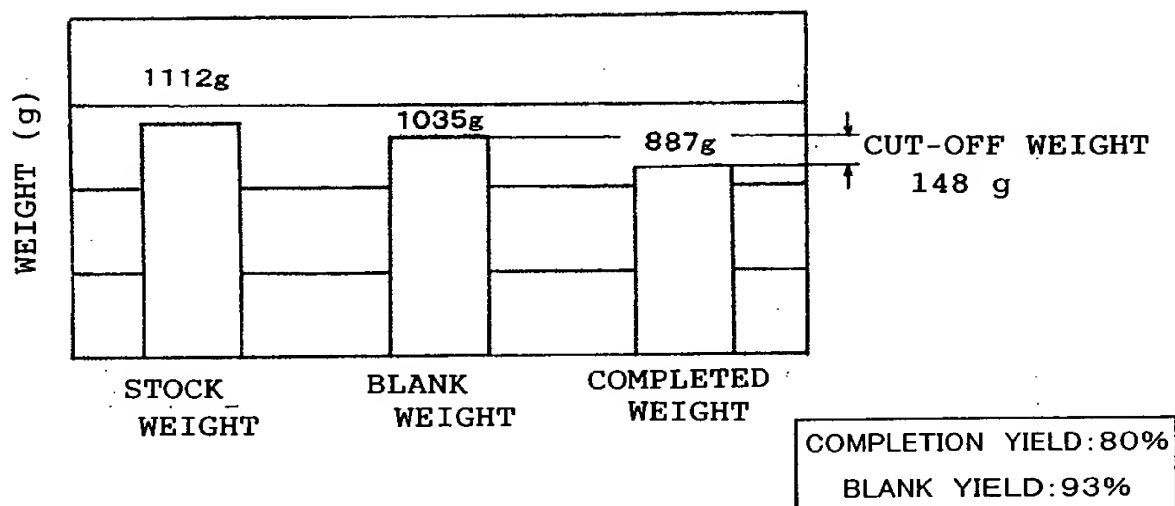


FIG. 34

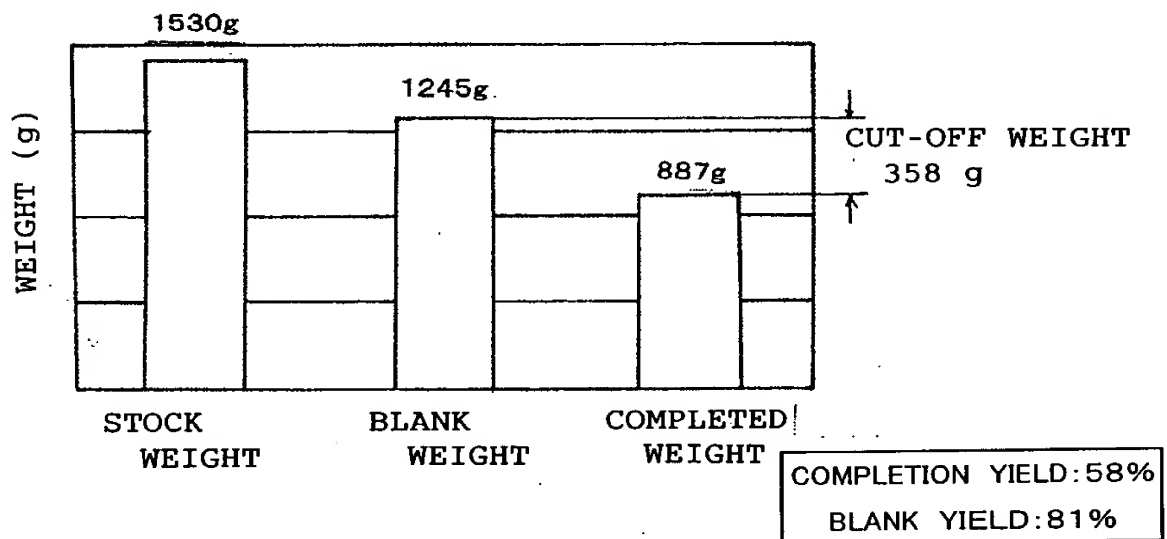


(INVENTIVE COLD-FORGING METHOD)



(a)

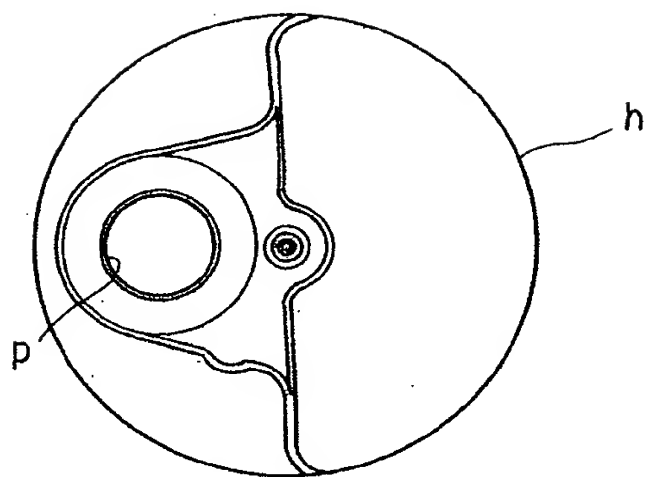
(CONVENTIONAL COLD-FORGING METHOD)



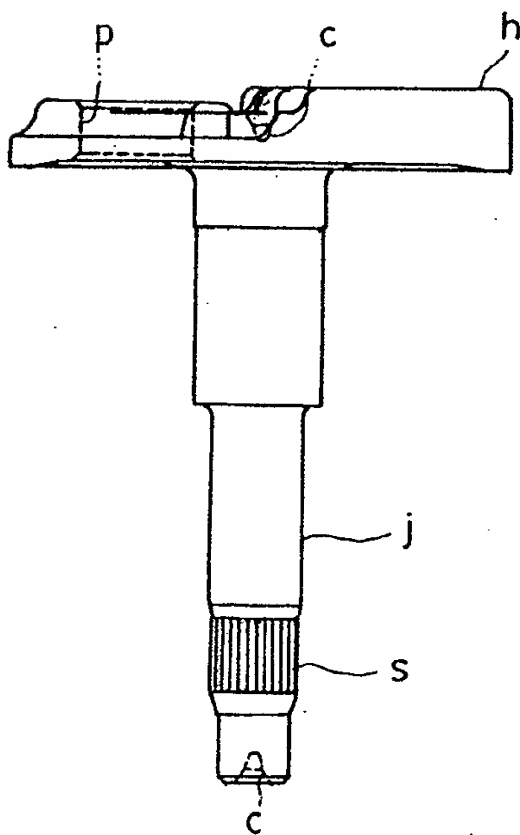
(b)

FIG. 33

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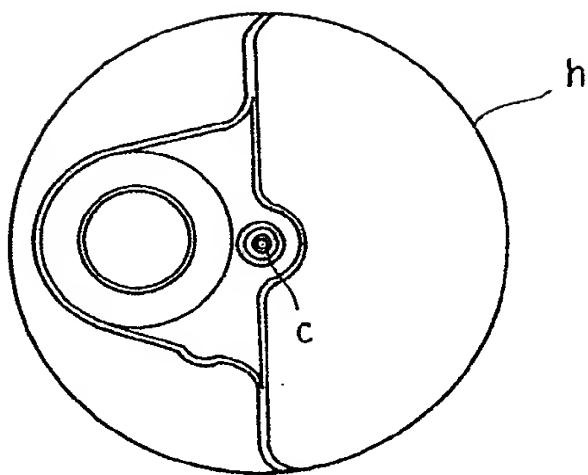


(a)

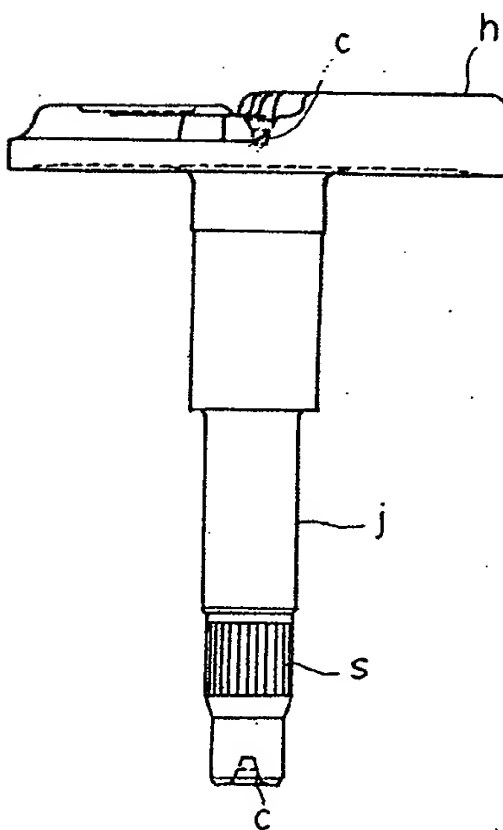


(b)

FIG. 32

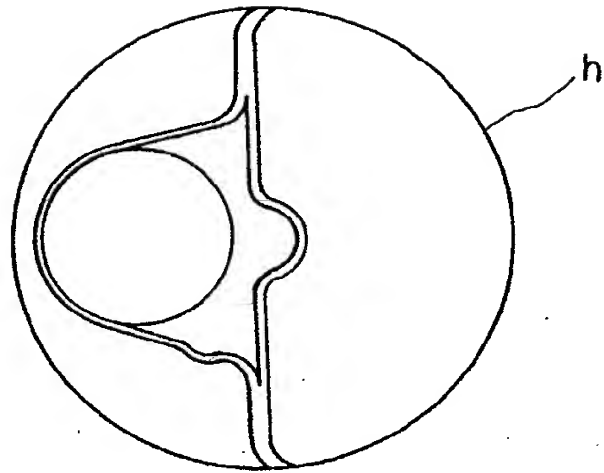
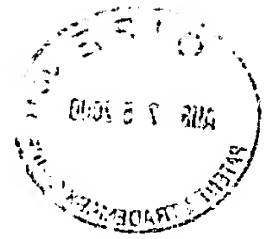


(a)

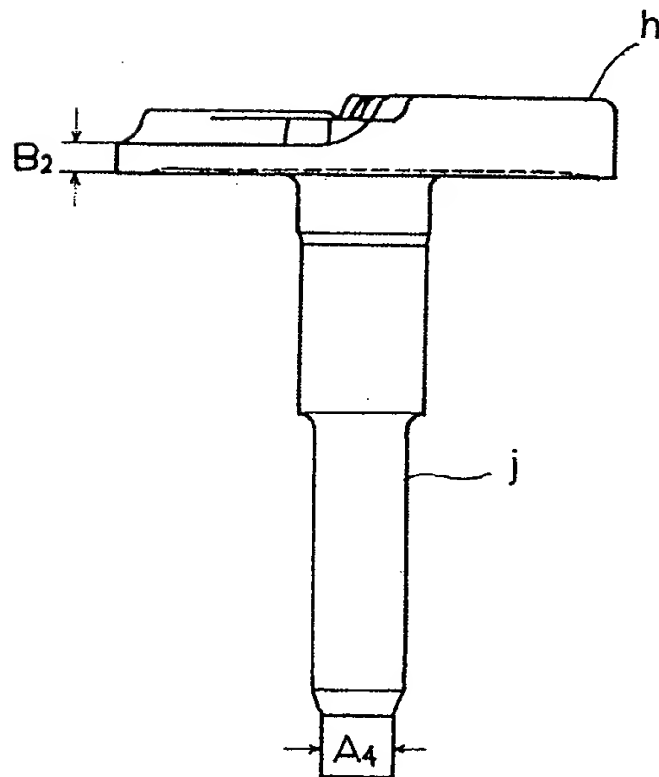


(b)

FIG. 31



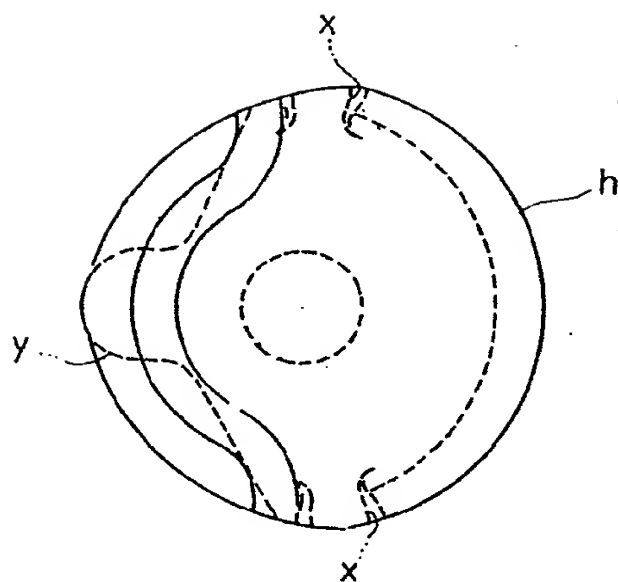
(a)



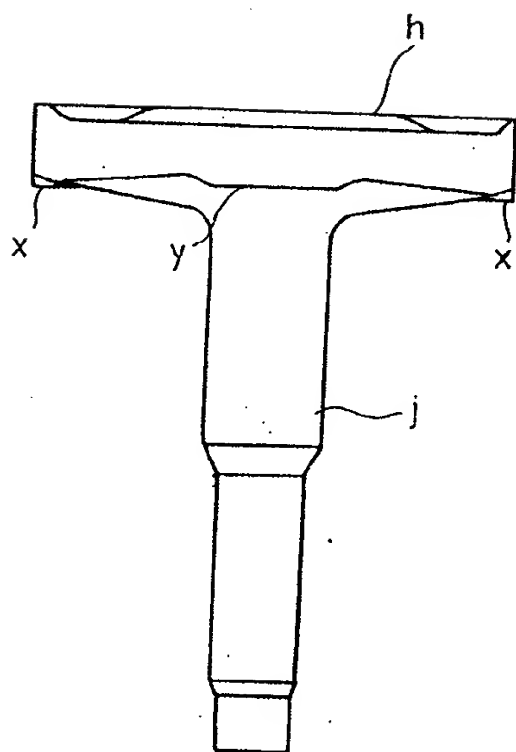
(b)



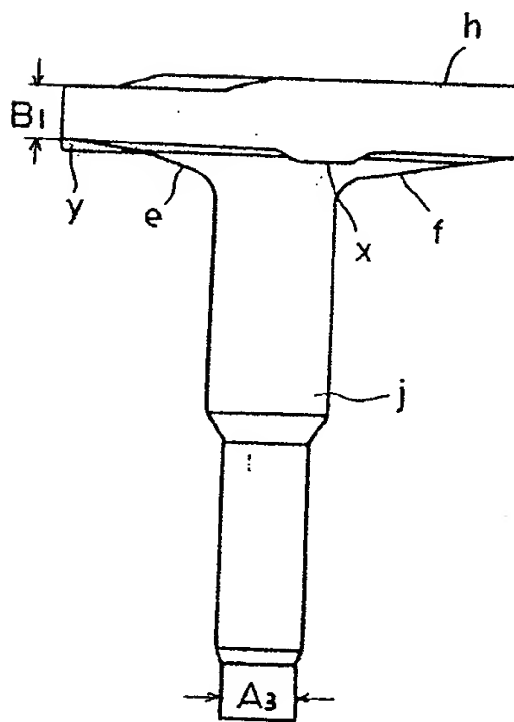
FIG. 30



(a)

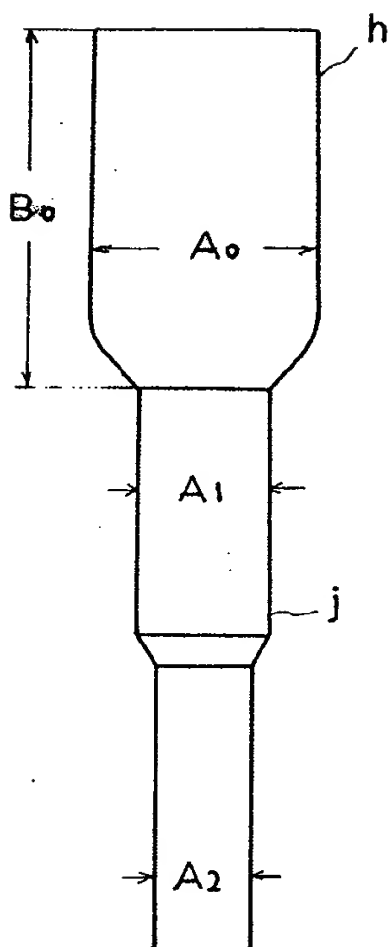
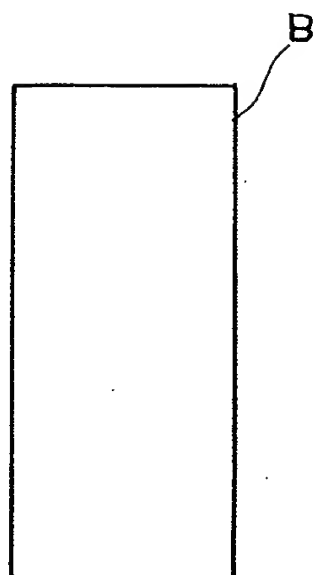


(b)



(c)

FIG. 29



(a)

(b)

FIG. 27

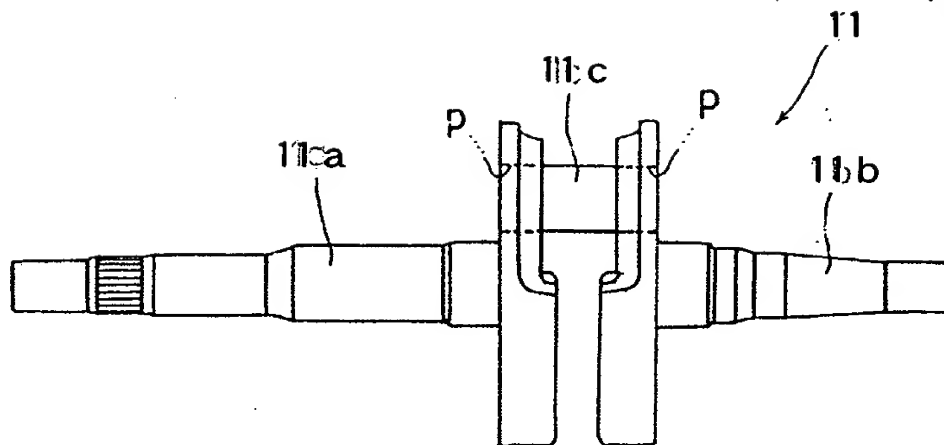
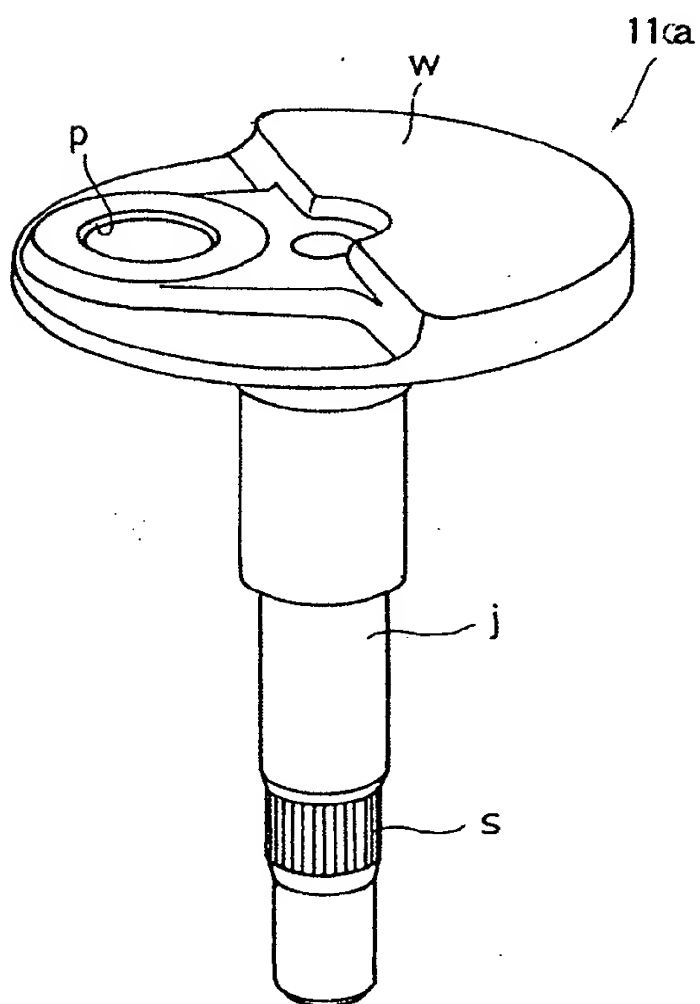


FIG. 28



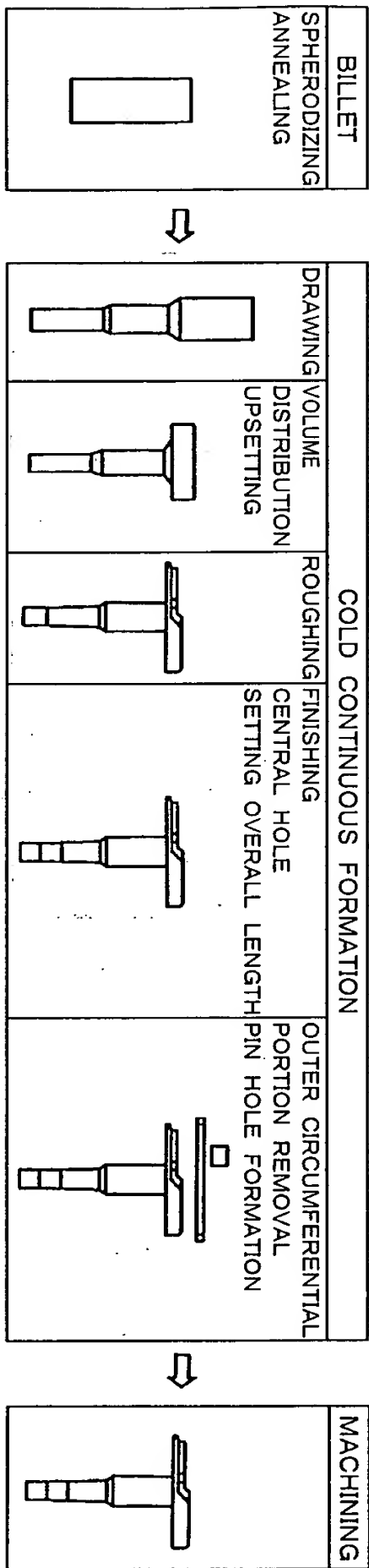


FIG. 26

FIG. 25

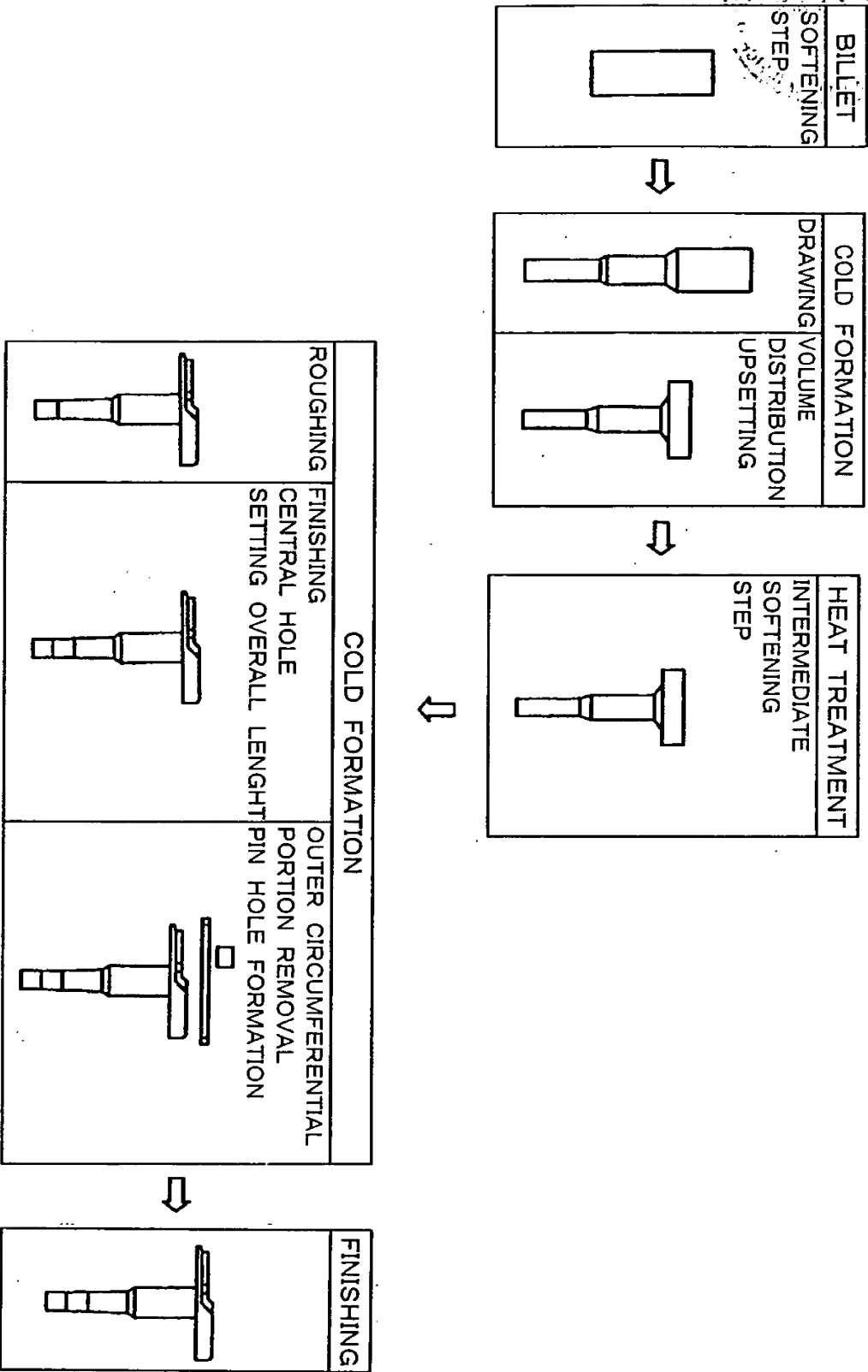


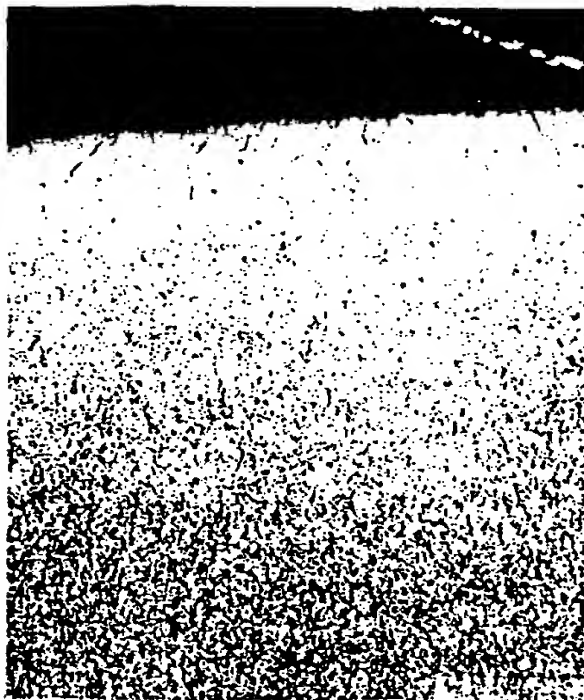
FIG. 24



AFTER SPHERODIZING ANNEALING PATTERN 2  
1/2 R PART  $\times$  400



FIG. 22



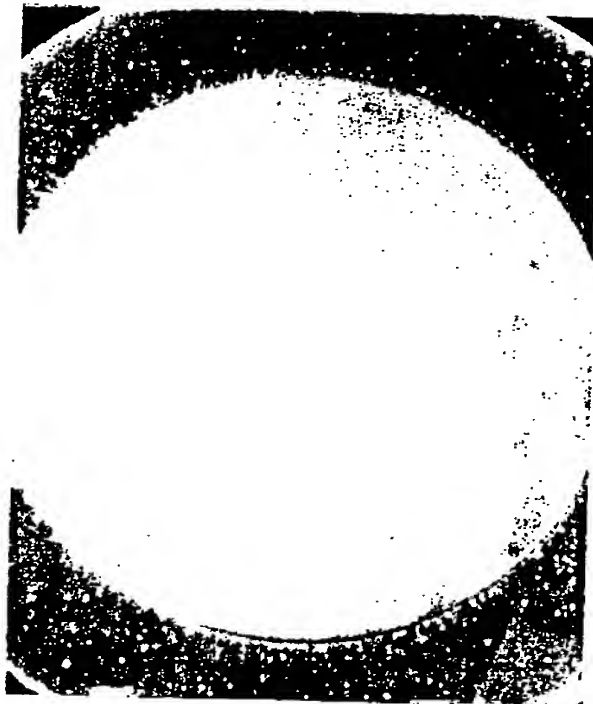
AFTER SPHERODIZING ANNEALING PATTERN 2  
SURFACE LAYER  $\times 100$

FIG. 23



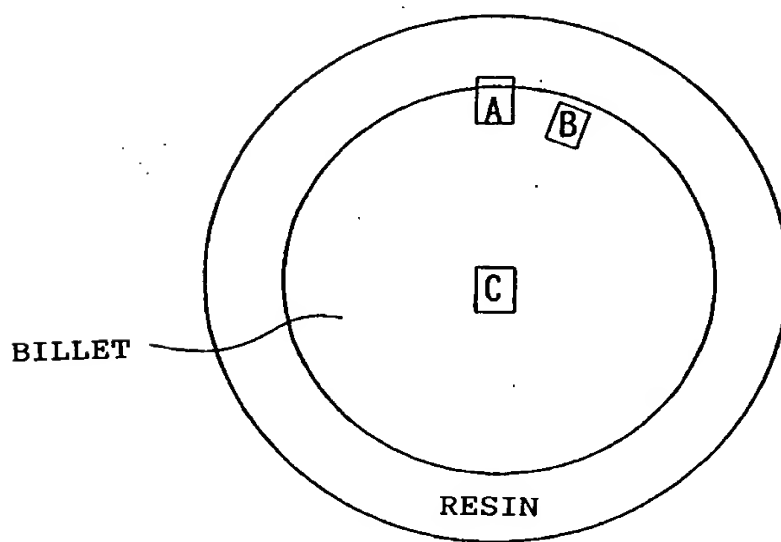
AFTER SPHERODIZING ANNEALING PATTERN 2  
SURFACE LAYER  $\times 400$

FIG. 21



MARTENSITIC MATERIAL  
AFTER SPHERODIZING ANNEALING PATTERN 2  
x 2. 1

(a)



(b)



FIG. 20



AFTER SPHERODIZING ANNEALING PATTERN 1  
1/2 R PART  $\times$  400

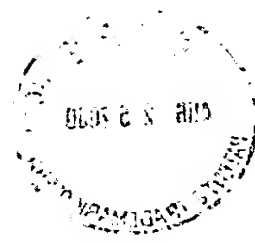
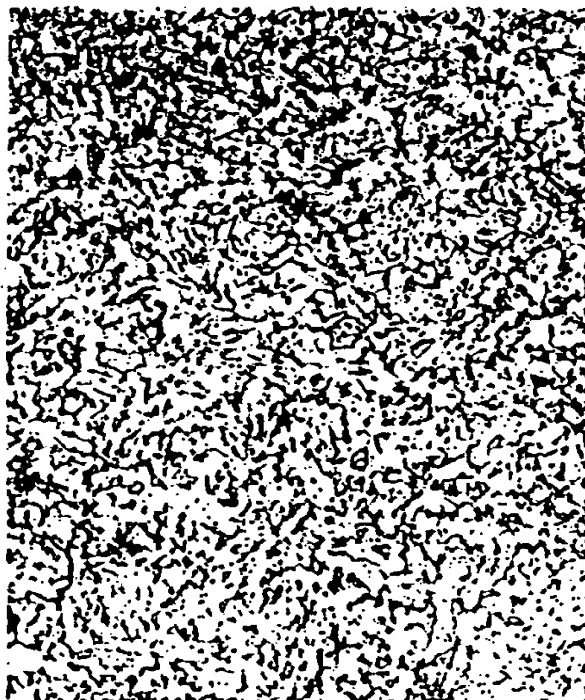


FIG. 18



AFTER SPHERODIZING ANNEALING PATTERN 1  
SURFACE LAYER  $\times 100$

FIG. 19



AFTER SPHERODIZING ANNEALING PATTERN 1  
SURFACE LAYER  $\times 400$

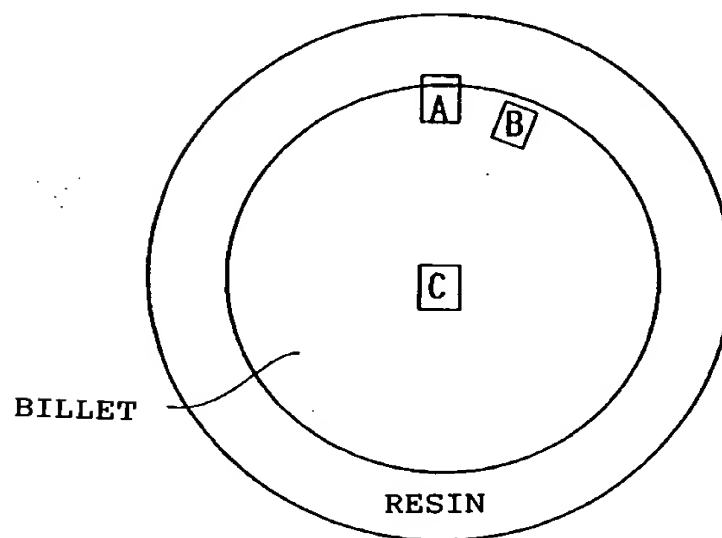


FIG. 17



MARTENSITIC MATERIAL  
AFTER SPHERODIZING ANNEALING PATTERN 1  
x 2. 1

(a)



(b)

FIG. 15



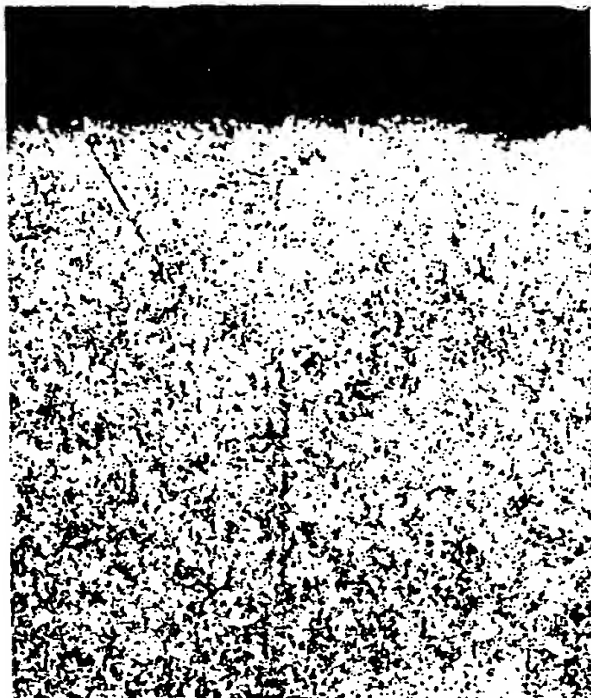
PRIOR TO SPHERODIZING ANNEALING  
1/2 R PART  $\times 400$

FIG. 16



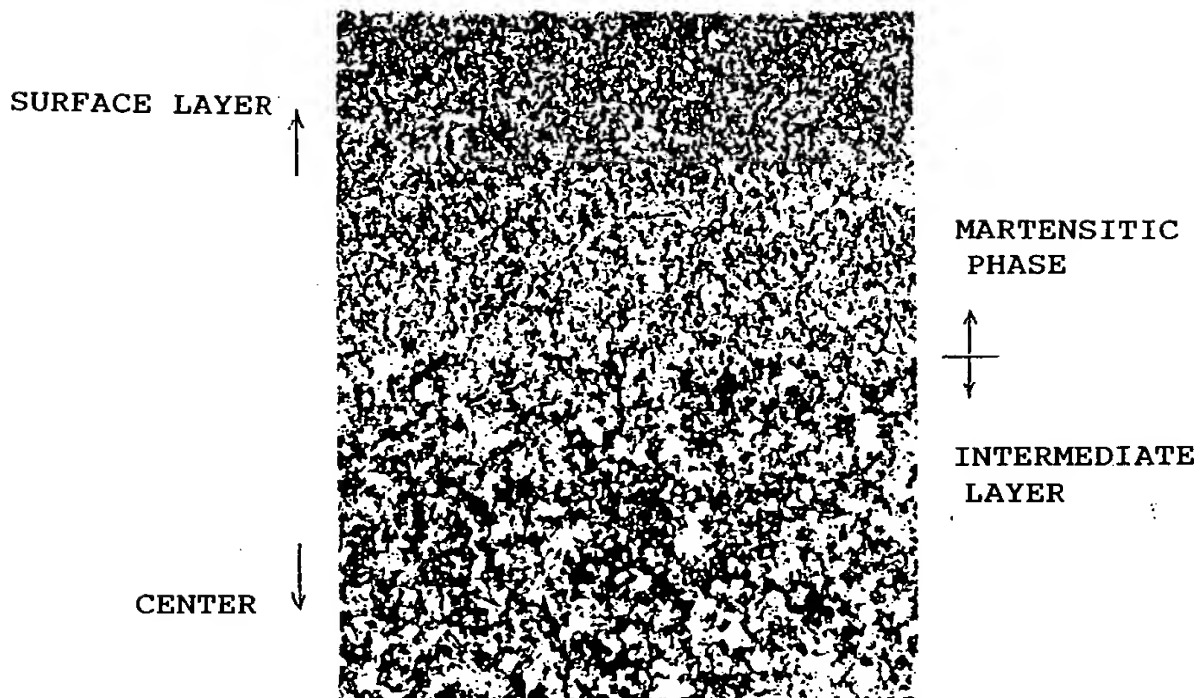
PRIOR TO SPHERODIZING ANNEALING  
CENTRAL PART  $\times 400$

FIG. 13



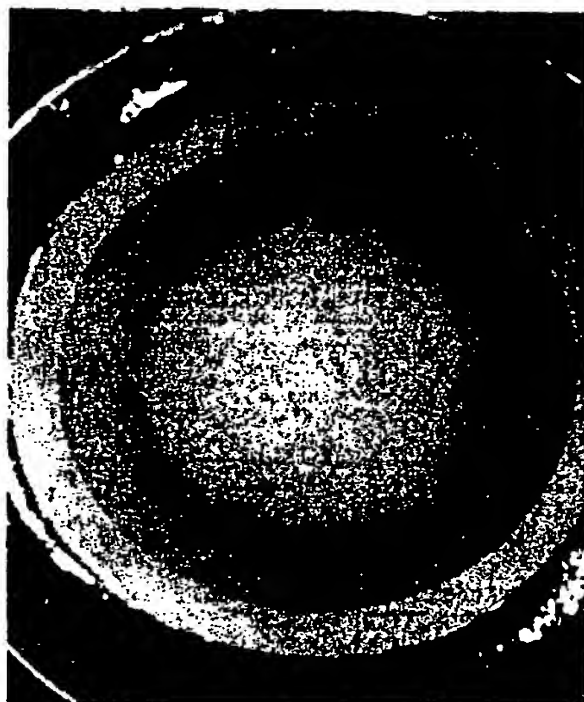
PRIOR TO SPHERODIZING ANNEALING  
SURFACE LAYER  $\times 100$

FIG. 14



PRIOR TO SPHERODIZING ANNEALING  
SURFACE LAYER AND INTERMEDIATE LAYER  $\times 200$

FIG. 12



MARTENSITIC MATERIAL  
(a) PRIOR TO SPHERODIZING ANNEALING  
× 2.1

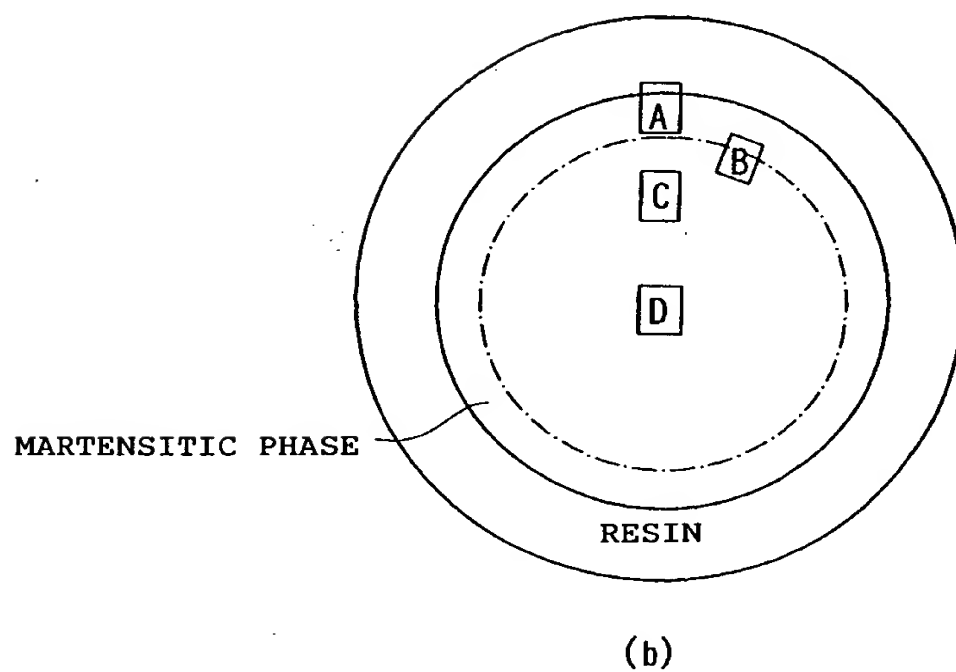
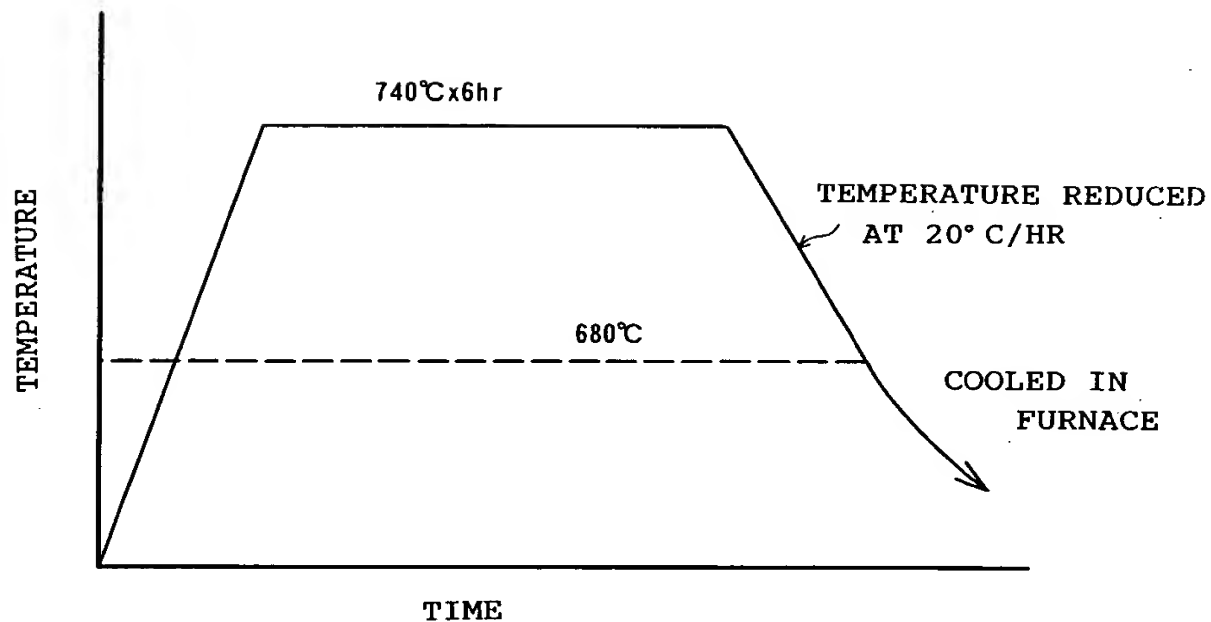
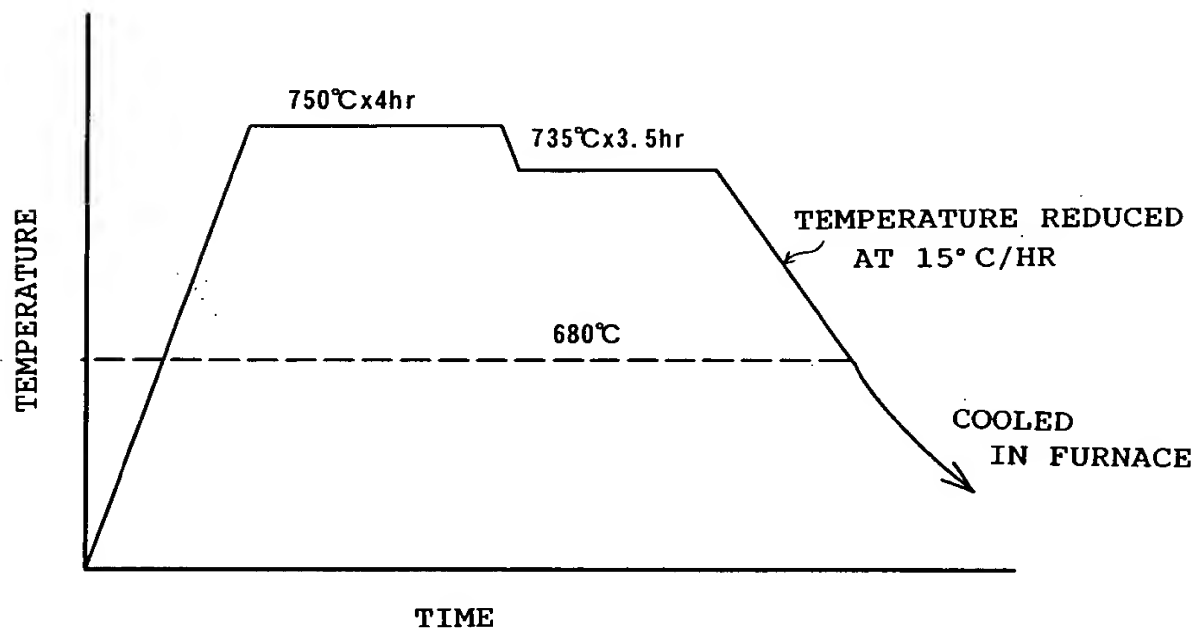


FIG. 11



(a)



(b)

FIG. 10

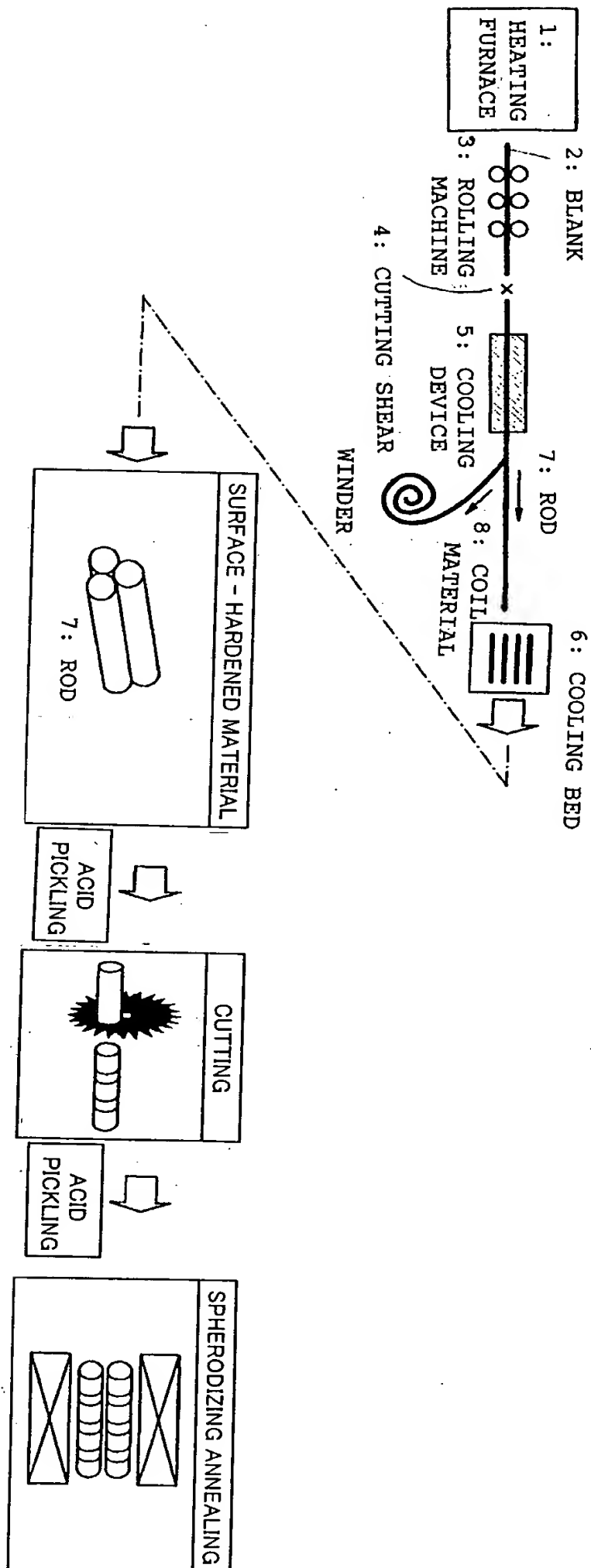




FIG. 9

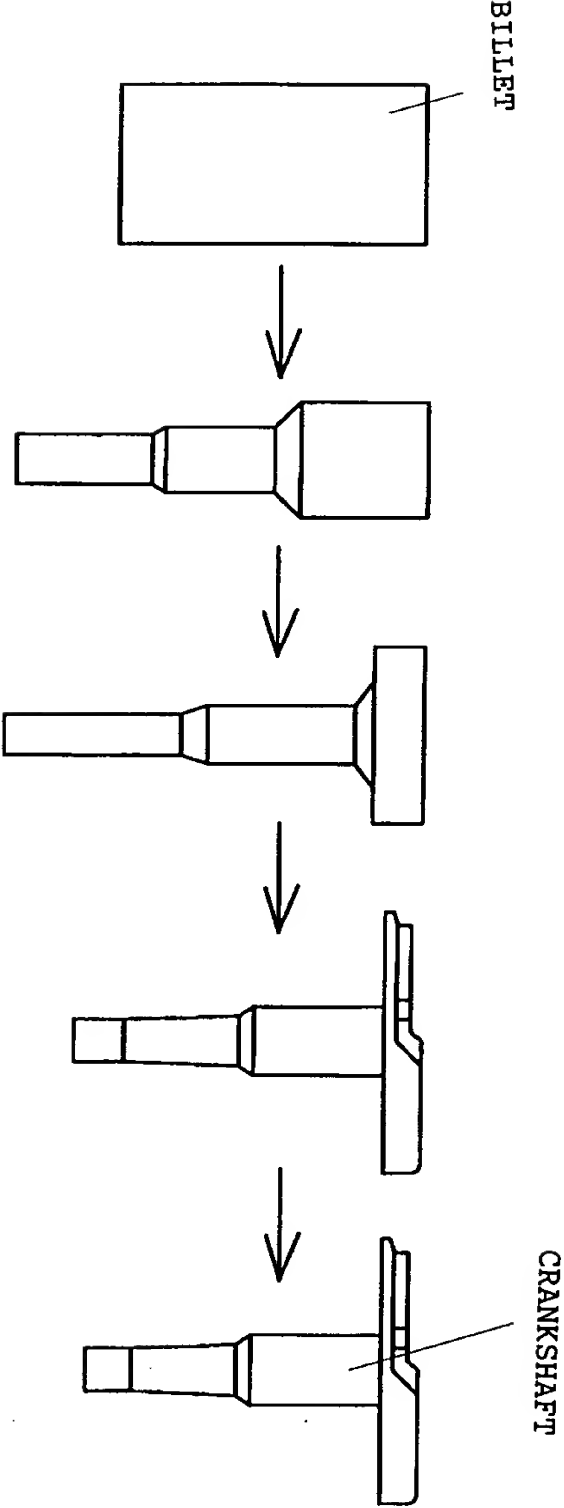


FIG. 8

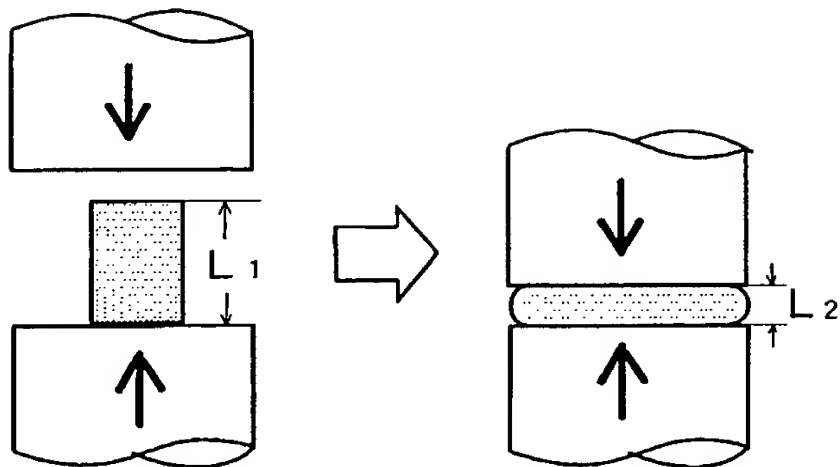




FIG. 6

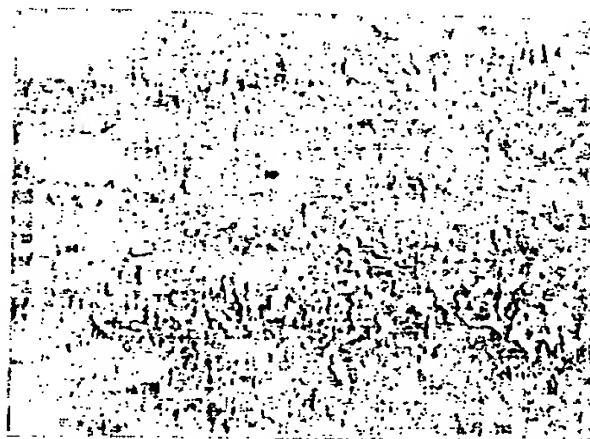
(A) MATERIAL 1

ASPECT RATIO = 506 %



(B) MATERIAL 2

ASPECT RATIO = 347 %

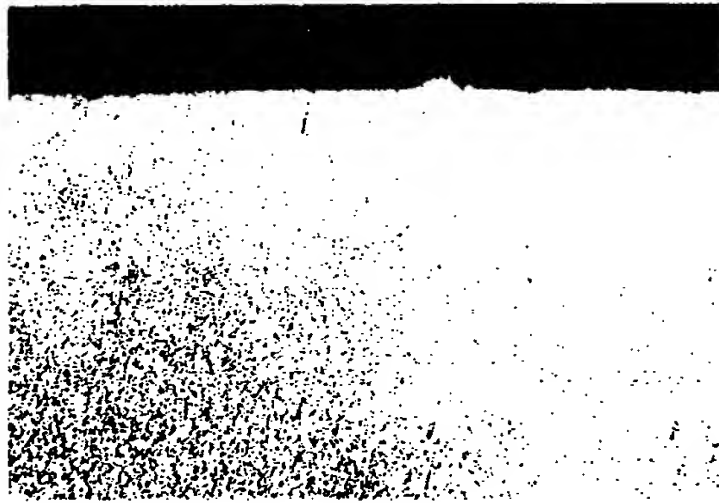


(C) MATERIAL 3

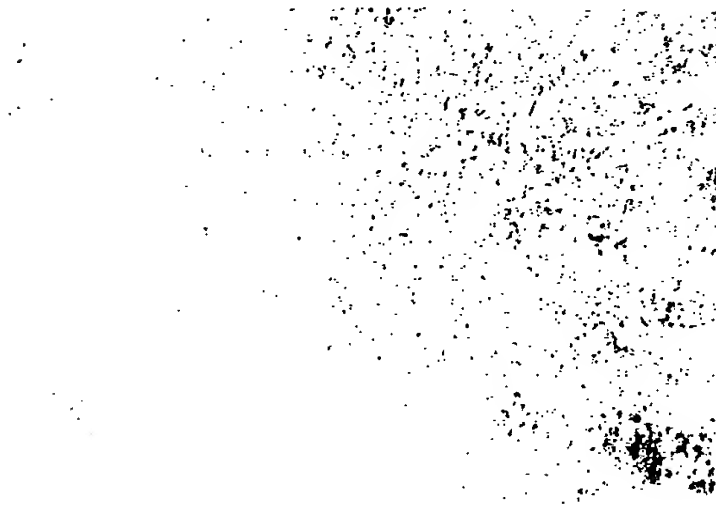
ASPECT RATIO = 300 %



FIG. 5



(a)



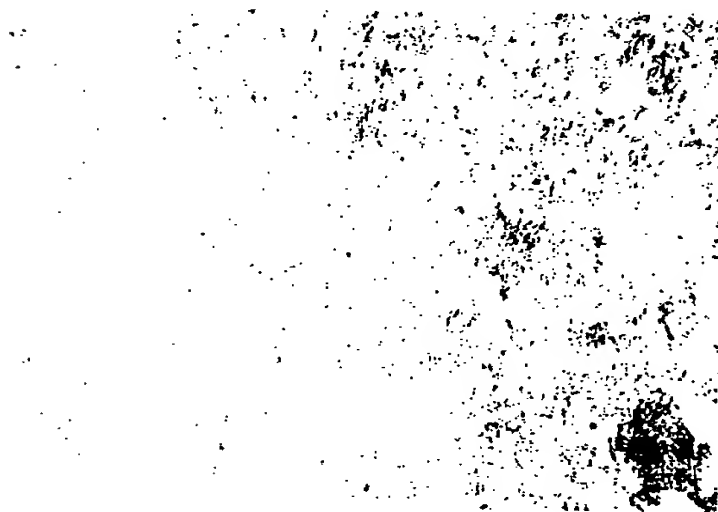
(b)



FIG. 4

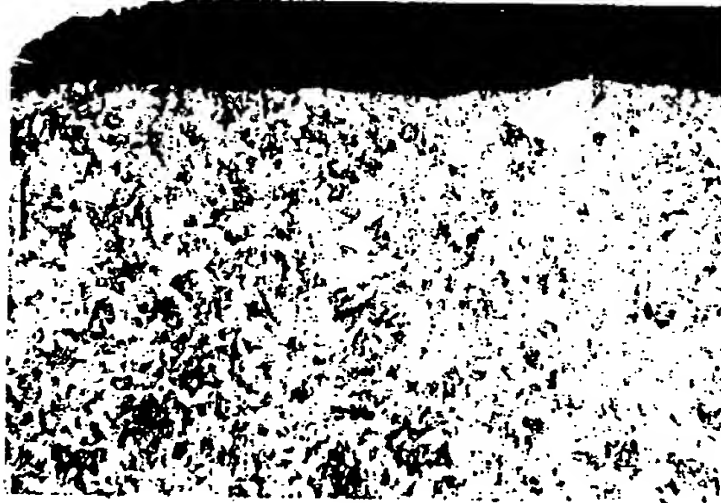


(a)

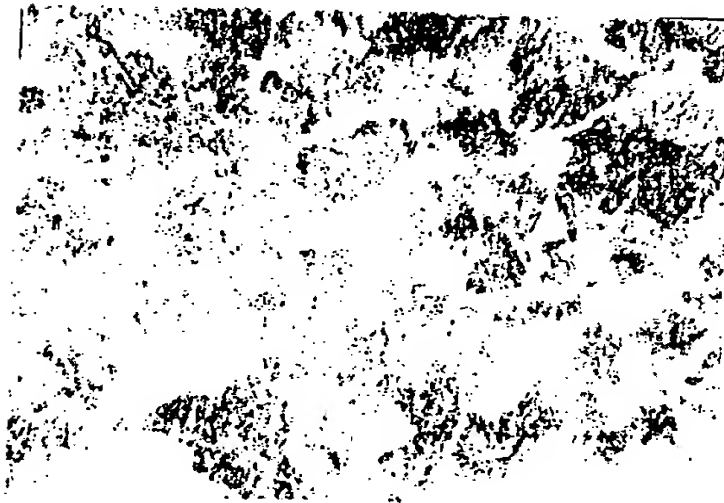


(b)

FIG. 3



(a)



(b)



FIG. 2

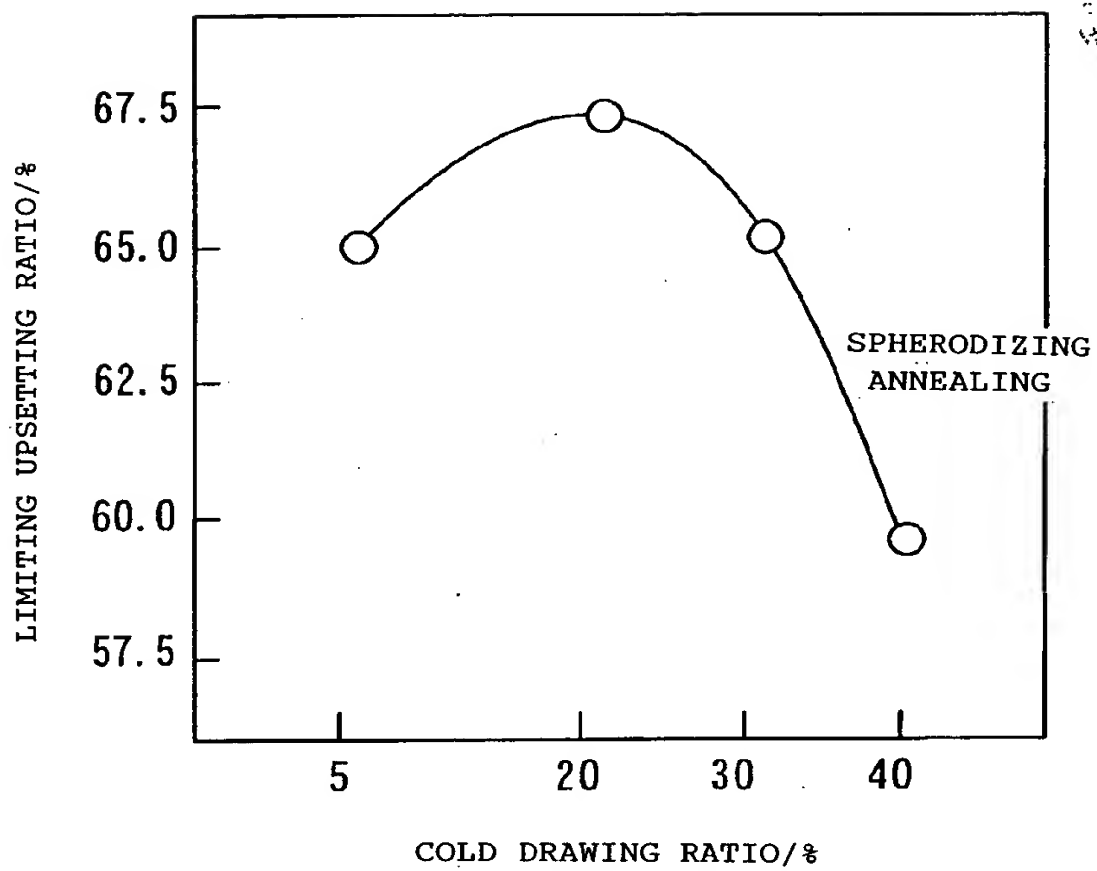




FIG. 1

